Drexel, Missouri
Water Supply Study
City Lake #2

Drexel has 2 lakes. Only lake number 2 was surveyed and included in this analysis. Drexel is located in the South West corner of Cass County, Missouri.

The record period of drought was used to estimate if Drexel's water supply was adequate to provide ample water during extreme drought. The 1950's were determined to be that period.

The 30-year average rainfall is 42.05 inches. Rainfall at the Harrisonville gage was used in this analysis. For the period 1953 through 1957, annual rainfall was 28.8, 35.7, 28.4, 21.3, and 37.5 inches.

Drexel has not been considering themselves to be a major water user. As a result they have not been reporting their water use. They are now using enough water to be considered a major water user and will be reporting their usage. The Safe Drinking Water Information System (SDWIS) database indicates they are currently using an average of 102,600 gallon per day. The Maximum day usage reported is 161,000 gallon.

Optimized demand is 119,200 gallon per day.

Drainage area of the lake is 534 acres.

Drexel's Lake analysis consisted of using the NRCS's computer program "RESOP". This program analyzes remaining stored water at the end of each month by summing gains and losses.

Following is the data by control word for input to the "RESOP" program.

STO-AREA Elevation-Storage and Elevation-Area data were determined from June, 5, 2003 survey made by USGS.

Drexel Lake #2

ELEV Feet	AREA Acres	VOLUME Ac-Ft	
952	0.12	0.04	
954	1.0	1.0	
956	2.4	4.3	
958	4.5	11.1	
960	7.3	22.6	
962	11.2	40.9	
964	16.6	68.5	
966	23.4	108.3	
967	26.8	133.3	
968	30.8	162.1	
968.1	31.3	165.2	Water Surface on 6/5/2003
970	40.2	233.4	
972	46.7	321.5	
972.5	47.9	345.1	Spillway

LIMITS Full Pool storage 345.1 Ac.Ft.
Minimum Pool storage 10 Ac.Ft.
Starting storage was considered at full pool elevation.
The drainage area of the lake is 0.83 square miles.

GENERAL The adjustment factor of 0.76 to convert from pan evaporation to lake evaporation was applied prior to entering the data for the control word EVAP. As a result a factor of 100 is applied.

The record period of drought is in the 1950's.
Analysis began in January 1951 and ended December 1959.

SEEPAGE The reservoir seepage varied from 0 seepage near empty to a maximum of 1.0 inch per month at full pool. The material in the dam is compacted earth of clayey soils.

RAINFALL Rainfall data came from the Harrisonville, Mo. rain gage for the period 1951 through 1959.

RUNOFF This is the runoff into the lake from its drainage area. Regional monthly runoff values were determined from stream gage data.

Monthly runoff volumes in watershed inches was determined at the Little Blue River gage near Lake City, North East of Drexel. Another gage on Cedar Creek near Pleasant View, Missouri was analyzed. Because Little Blue River watershed is nearer to Drexel, and the soils and topography of Little Blue River is more nearly like that at Drexel, it was selected to represent regional runoff. If runoff did not appear reasonable when compared to rainfall, it was necessary to examine daily rainfall values for that month. Antecedent moisture was estimated for each rainfall event and adjustments to NRCS runoff curve number was made to arrive at runoff for each storm.

EVAP. Pan evaporation at the Lakeside gaging station near the Lake of the Ozarks was used to determine pan evaporation. The adjustment to lake evaporation was 0.76.

DEMAND Drexel has not been reporting their water use because they had not considering themselves to be major water users. They will be reporting their use in the future. This RESOP run was for the daily use recorded in the SDWIS data-base. The daily amount recorded is 0.1026 MGD. The optimized use would be 0.1192 million gallon per day.

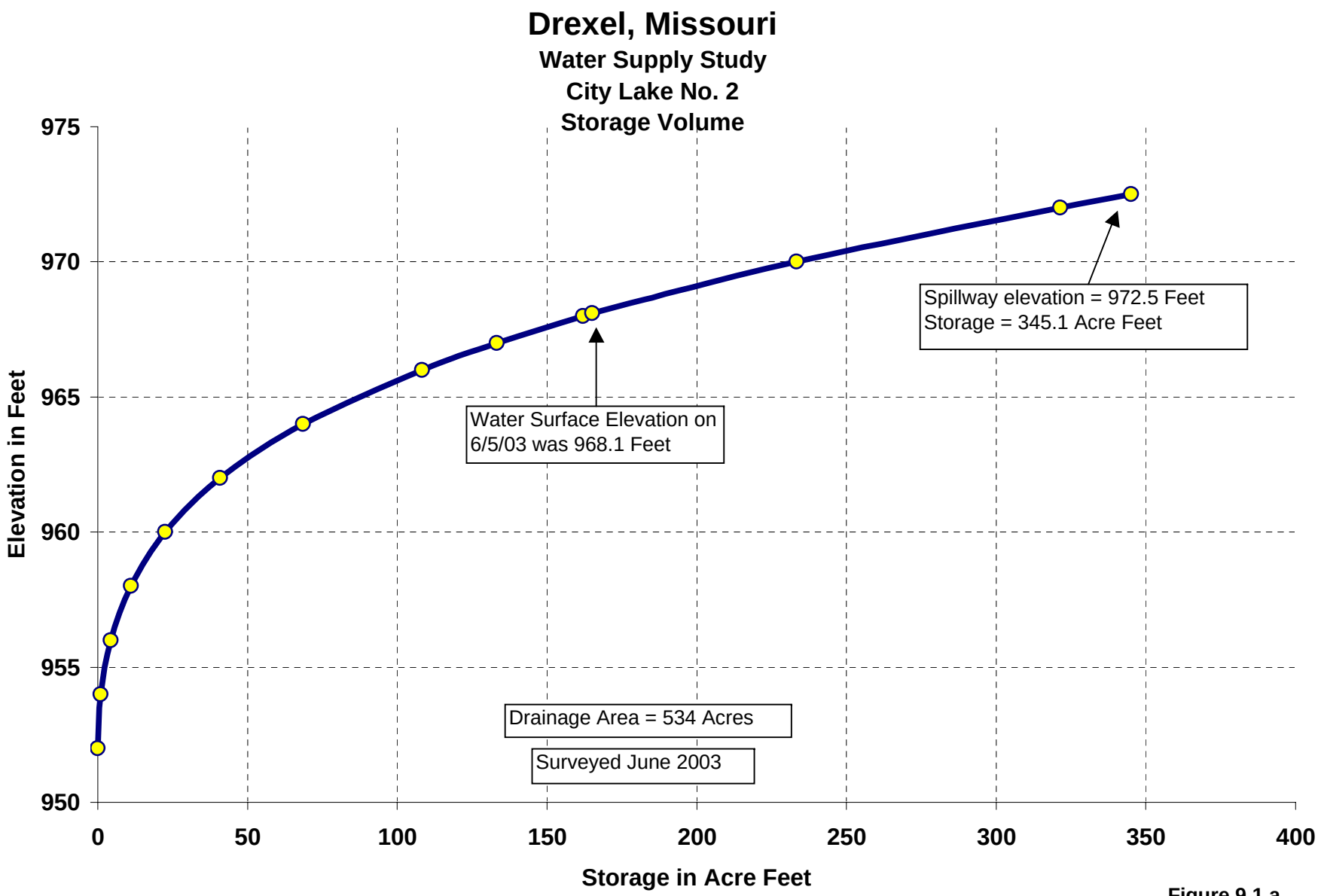

Drexel, Missouri
Water Supply Study
City Lake No. 2
Storage Volume
Elevation in Feet
975
970
965
960
955
950
0
50
100
150
200
250
300
350
400
Storage in Acre Feet
Spillway elevation = 972.5 Feet
Storage = 345.1 Acre Feet
Water Surface Elevation on
6/5/03 was 968.1 Feet
Drainage Area = 534 Acres
Surveyed June 2003

Figure 9.1.a

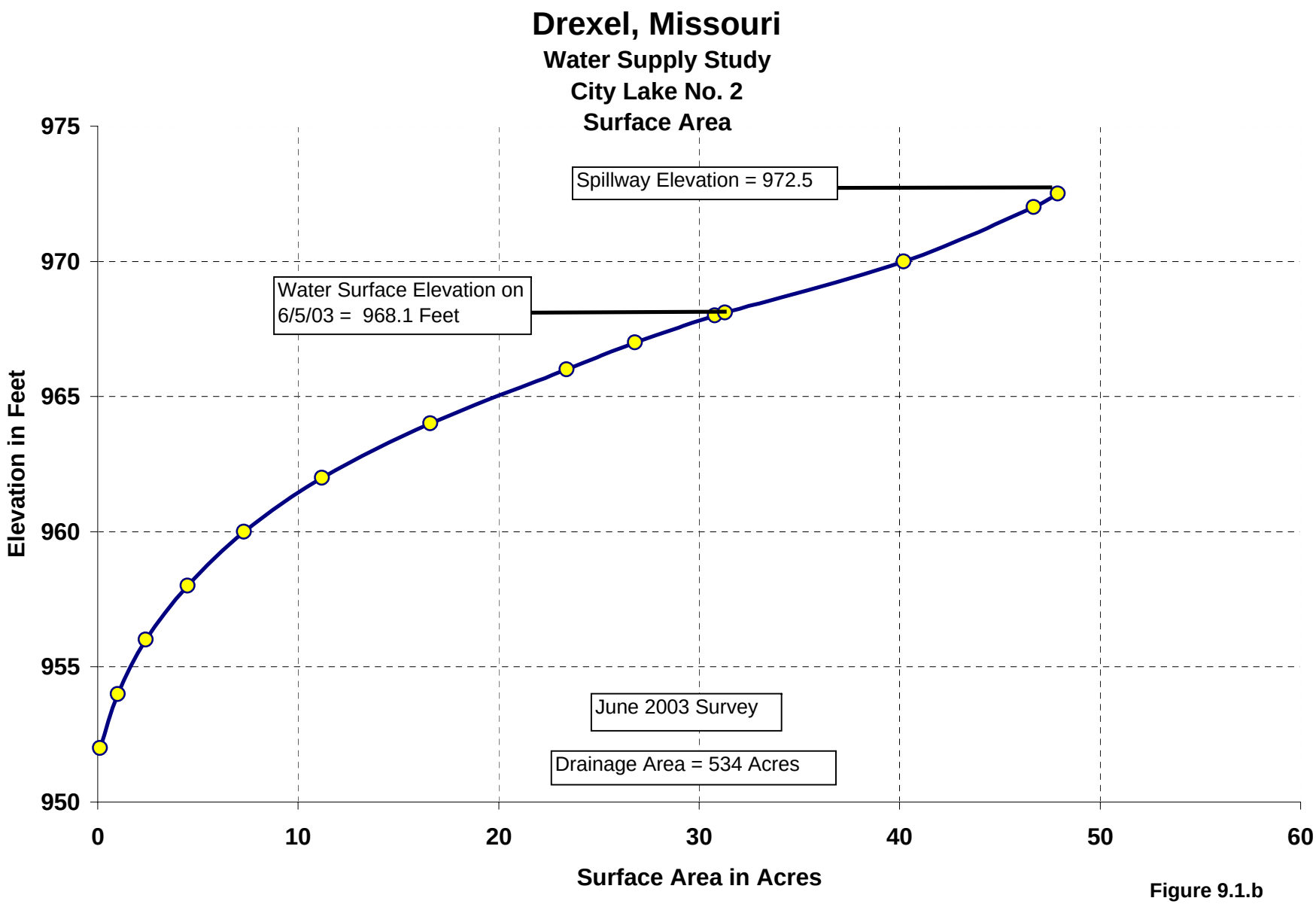

Drexel, Missouri
Water Supply Study
City Lake No. 2
Surface Area
Spillway Elevation = 972.5
Water Surface Elevation on
6/5/03 = 968.1 Feet
June 2003 Survey
Drainage Area = 534 Acres
Elevation in Feet
975
970
965
960
955
950
0
10
20
30
40
50
60
Surface Area in Acres

Figure 9.1.b

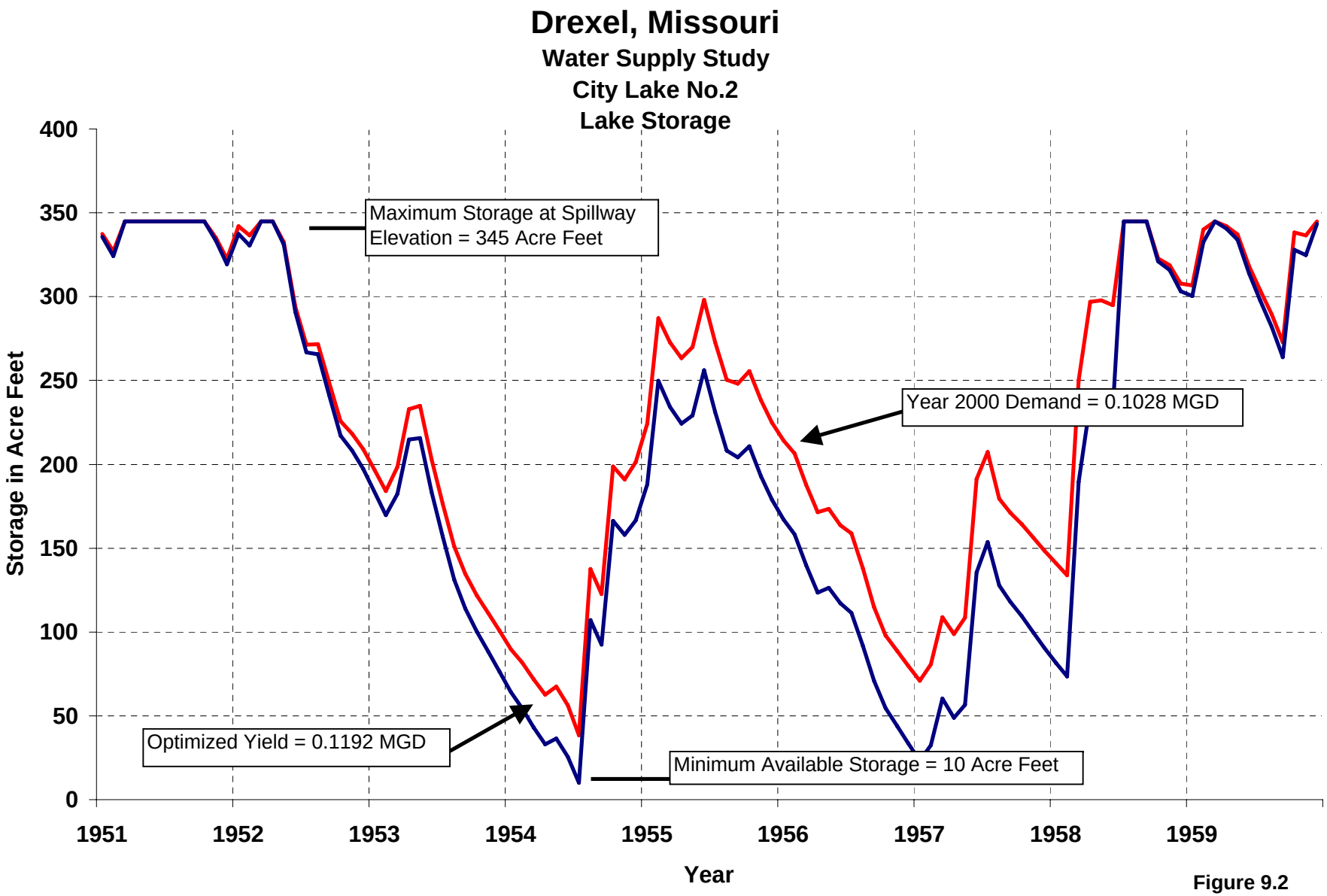
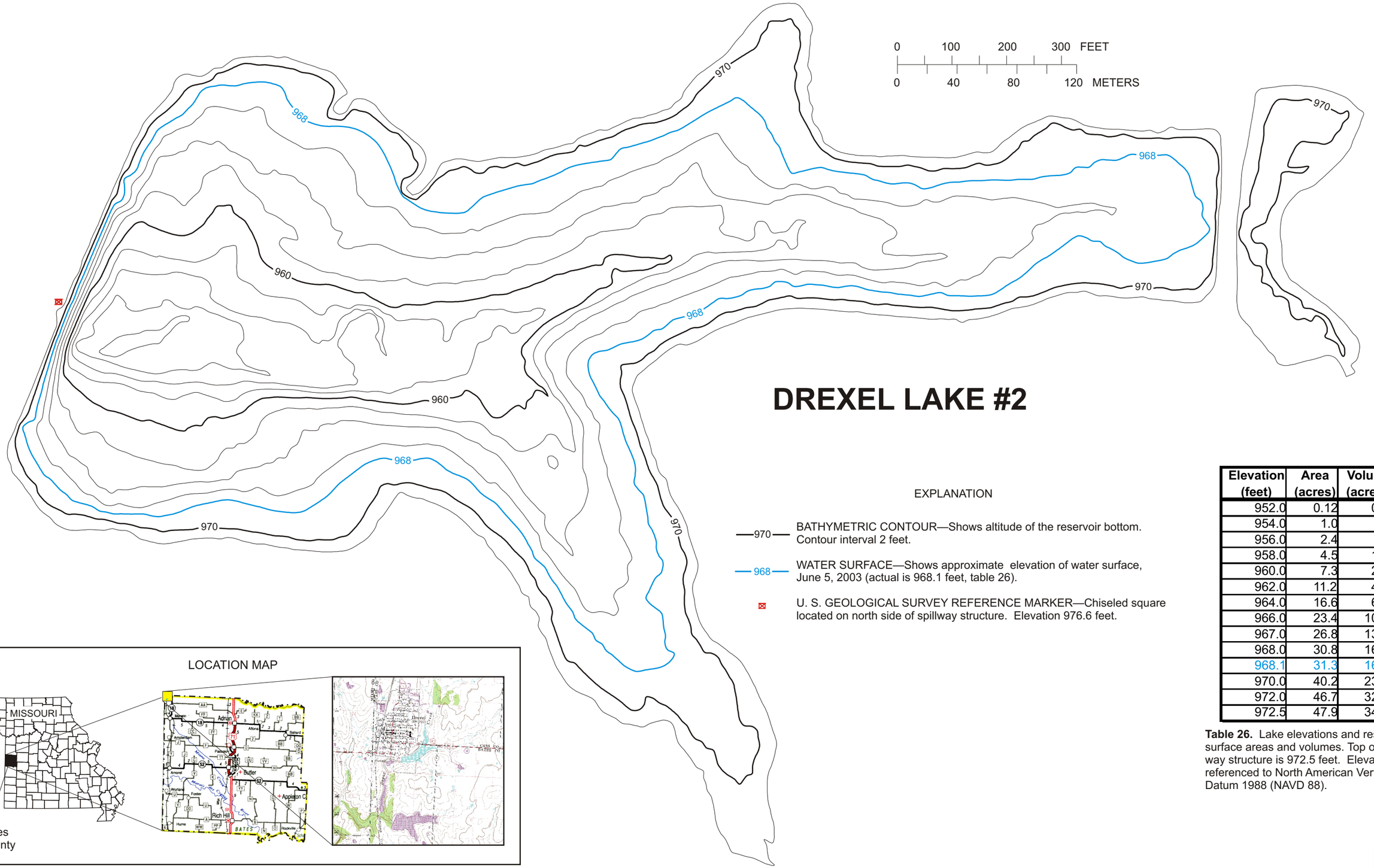

Drexel, Missouri
Water Supply Study
City Lake No.2
Lake Storage
Storage in Acre Feet
400
350
300
250
200
150
100
50
0
1951
1952
1953
1954
1955
1956
1957
1958
1959
Year
Maximum Storage at Spillway
Elevation = 345 Acre Feet
Year 2000 Demand = 0.1028 MGD
Optimized Yield = 0.1192 MGD
Minimum Available Storage = 10 Acre Feet

Figure 9.2



DREXEL LAKE #2

EXPLANATION

970 — BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet.

968 — WATER SURFACE—Shows approximate elevation of water surface, June 5, 2003 (actual is 968.1 feet, table 26).

U. S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled square located on north side of spillway structure. Elevation 976.6 feet.

LOCATION MAP

Elevation (feet)	Area (acres)	Volume (acre-ft)
952.0	0.12	0.04
954.0	1.0	1.0
956.0	2.4	4.3
958.0	4.5	11.1
960.0	7.3	22.6
962.0	11.2	40.9
964.0	16.6	68.5
966.0	23.4	108.3
967.0	26.8	133.3
968.0	30.8	162.1
968.1	31.3	165.2
970.0	40.2	233.4
972.0	46.7	321.5
972.5	47.9	345.1

Table 26. Lake elevations and respective surface areas and volumes. Top of spillway structure is 972.5 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).

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Figure 26. Bathymetric map and table of areas/volumes of Drexel Lake #2 near Drexel, Missouri.

In cooperation with Missouri Department of Natural Resources